BIOL 309 – Developmental Biology

Lectures: Mondays and Thursdays, 1:00-2:20, Cunningham 146
Labs: Cunningham 240

Course coordinator: Bob Chow bobchow@uvic.ca
Office hours: Mondays/Thursday 2:30-3:30. If you cannot make these times, send me an email and we can set up another time to meet or have a Zoom call.

Lab instructor: Kristin Hackett <kristinhackett@uvic.ca>

Lectures will **<u>not</u>** be recorded or broadcast on Zoom.

Lecture pdf's will be available, but note:

- **before the lecture**: a "pre-lecture pdf" will be posted. It will be missing slides that contain answers to in-class questions

- **after the lecture**: it will be replaced by a "post-lecture pdf" containing all of the slides

Course description
This course examines animal development and will focus on cellular and molecular mechanisms that underlie developmental processes. A solid understanding of basic principles in molecular and cellular biology is required. Effort will be made to highlight relevance of developmental biology to our understanding of disease and lectures will incorporate recent discoveries from the primary literature. A major goal of this course is to help develop skills to: (i) evaluate the primary scientific literature, (ii) develop hypotheses based on pre-existing knowledge and (iii) design experiments to test hypotheses.

Reading material
(i)   Textbook: Gilbert Developmental Biology, 12th edition (lectures draw from, but do not strictly follow text). See last page of course outline for assigned reading schedule.
(ii) reading material will also be drawn from the primary literature, review articles and other sources, which will be posted on Brightspace.

Evaluation
(1) Lab   40%
(2) Midterm exam   30%
(3) Final exam   30%

Lab
The lab component is broken down into 2 sections: (i) a practical lab and (ii) a journal article review/"dry" lab (each worth 17% of final grade). There will be 5 practical labs and 4 journal article review/dry labs. Detailed information (including lab schedule) is posted in the **BIOL 309a Lab Manua**l, which can be purchased from the UVic Bookstore.

Breakdown of the lab grade:

Wet lab	17%	Dry lab (journal article review)	18%
In class assignments	5%	Pre-lab quizzes	4%
Lab report	12%	Oral presentation	5%
		Paper/mini-proposal	9%

<u>Wet and dry lab participation grade (5 %)</u> - this grade will cover participation in dry lab (brainstorming questions, involvement in class discussion) and wet labs (i.e. complete all procedure steps, make an effort to visualize the specimens provided during the lab period and contribute to laboratory discussions).

Midterm and Final exams

The midterm is compulsory and will be held on Monday Feb 27. It will cover material up to Feb 13 (i.e. including Vertebrate early development). The final exam will be similar in format and length to the midterm exam and will be held during the exam period. The final exam is <u>not</u> cumulative and will cover material starting from "Fly development" through to

Important background reading from the textbook

Basic molecular biology:
pp 56-88 of the textbook (Developmental Biology, 12th edition) covers important basic molecular biology background material that will be referred to through the course. This includes a review of the "central dogma" of gene expression, i.e. gene >> transcription [mRNA] >> translation [protein]

Signal transduction pathways:
pp 115-128 describes the major cell-cell signaling pathways that are discussed in the class (e.g. Hedgehog, Wnt, Notch, TGF-beta, FGF, tyrosine receptor kinase, etc…)

Experimental techniques discussed in the course:
- a good description of some of the techniques that will be referred to in the course can be found on pages 20-25, 50-52, 89-95 in the 95 in 52, 89

Tentative lecture schedule:

Date	Topics	10th Edition	11th Edition	12th Edition
Jan 9,12	Fertilization/early cleavage	117-151	218-247	216-240
Jan 16-23	Invertebrate early development	31-45, 69-96, 153-161, 170-173,217-239	11-19, 45-65, 95-139, 238-239, 251-254, 265-268, 311-332	14-25, 39-46, 247-250, 303-323
Jan26-Feb13	Vertebrate early development			